

TITLE OF INVENTION

Trailer Jack Assistance Apparatus

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

5 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR
DEVELOPMENT

[0002] Not Applicable

BACKGROUND OF THE INVENTION

1. Field of Invention

10 **[0003]** This invention pertains to jacking or lifting devices for use with
trailers. More particularly, this invention pertains to an apparatus that locates the
operator controls at a more convenient height for operation of a conventional lifting
jack and thereby assists in the operation of the jack.

2. Description of the Related Art

15 **[0004]** Generally, lifting jacks are made in many different types and sizes,
ranging from small jacking devices used for leveling and supporting work on wood
planers to powerful hydraulic jacks capable of lifting a locomotive or even greater
weights. The mechanisms used in the different types of jacks also vary greatly,
with one of the more popular types consisting of a lifting screw which is inserted in
20 a suitable base.

[0005] A common conventional jacking device for use with trailers,
automobiles, trucks, campers, and the like includes a vertical member having a
base for supporting the jack and an engaging member somehow mounted on the
vertical member which may be either attached to, or positioned under the object to
25 be lifted. The engaging member is moved upwardly along the vertical member by
way of whatever jacking mechanism is selected, thereby lifting the object. For
example, in order to lift the hitching end of a trailer, which is to be attached to a

vehicle, the engaging member is fixed to the trailer frame near the hitch, and the engaging member is moved vertically with respect to the vertical member by means of a continuous screw mechanism.

[0006] To aid in the use of jacking devices, it is known in the art to have two means of vertical adjustment. A coarse vertical adjustment is used with no load on the jack to bring the base close to the ground. A fine vertical adjustment is used under full load to have the base fully engage the ground surface and to lift the object away from the ground. The use of both a coarse and fine adjustment does away with the need for having to lower or raise the jack by way of a single, slow operating, and continuous jacking mechanism.

[0007] One jacking device used with trailers is the type taught in United States Patent Number 4,238,113, entitled "Jacking Device," issued to Adams on December 9, 1980. Adams discloses a jacking device for attaching to a vehicle or trailer that has a coarse and fine vertical adjustment. The device of the Adams patent has a telescoping member with a screw mechanism for making fine height adjustments under load and a mounting column for making rough height adjustments in an unloaded state.

[0008] Typical of one of the jacking devices currently used with many trailers is the type taught in United States Patent Number 4,796,864, entitled "Spring Loaded Drop Foot Trailer Jack," issued to Wilson on January 10, 1989. The device disclosed in the Wilson patent includes telescoping tubular members that are adjusted vertically by aligning a locking pin between two members for coarse vertical adjustment under no-load conditions and by rotating a screw mechanism for fine vertical adjustment under load. The jack is deployed by allowing one member to drop to a position near the ground, at which point the locking pin is engaged. The screw mechanism is then used to telescope the members such that the lower member contacts the ground and the member attached to the vehicle is lifted away from the ground. Additionally, the Wilson patent claims a means for retracting the member used for coarse adjustment.

[0009] Variations of the above type of jack include that disclosed in United States Patent Number 4,978,104, entitled "Quick Release Jack," issued to Gipson,

Jr., on December 18, 1990. The jack disclosed in the Gipson patent uses a rack and pinion assembly for vertical adjustment. Coarse vertical alignment of the jack is achieved by disengaging the drive gear from the vertical member, thereby allowing it to travel freely. United States Patent Number 5,755,430, entitled

5 "Trailer Jack Leveling Adapter," issued to Couch on May 26, 1998, discloses a jacking device that has a base with a vertical threaded member extending from it. The threaded member engages a threaded receptor mounted on one of two telescoping tubes. The tubes are fixed in an extended position by a locking pin inserted through aligned holes in the tubes. Operation of this device requires

10 access to the base, which is in contact with the ground.

BRIEF SUMMARY OF THE INVENTION

[0010] According to one embodiment of the present invention, a jack assistance apparatus is provided. The jack assistance apparatus allows convenient access to the operator controls of a conventional jack, permitting the jack foot to be

15 lifted without requiring the operator to bend over and grasp the jack foot as it sits on the ground. A lever arm and guide tube is attached to a conventional jack. The conventional jack includes telescoping tubes that have a locking pin for coarse adjustment and a screw mechanism for fine adjustment. The lever arm engages the jack's locking pin handle and is used to operate the locking pin. The guide

20 tube contains a chain, one end of which is attached to the base and other attached to a ring or other type of handle. When the lever arm operates the locking pin to disengage the telescoping members of the jack, the chain runs free and permits the jack base to drop to the ground, at which time the lever arm operates the locking pin to lock the telescoping members in a fixed vertical position. To lift the base

25 from the ground, the lever arm operates the locking pin to disengage the telescoping members, and a pulling force on the ring or handle causes the chain to transmit a lifting force to the base, which is locked in a raised position by the lever arm operating the locking pin to lock the telescoping members.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

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[0011] The above-mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

5 Figure 1 is a perspective view of a jack assistance apparatus mounted on the lower end of a trailer jack;

Figure 2 is a perspective view of the jack assistance apparatus;

Figure 3 is an exploded diagram showing the jack assistance apparatus;

Figure 4 is a top view of the apparatus; and

10 Figure 5 is a side view of the apparatus.

DETAILED DESCRIPTION OF THE INVENTION

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[0012] An apparatus for assisting in the operation of a conventional trailer jack is disclosed. The jack assistance apparatus is generally illustrated in the figures as **10**. The illustrated embodiment of the jack assistance apparatus allows
15 convenient access to the operator controls of a conventional jack by allowing the jack foot **118** to be raised without requiring the operator to bend over and lift the jack foot as it sits on the ground. Also, the jack pin **120** can be operated at an elevated position by a lever arm **152**. Those skilled in the art will recognize that, although the jack assistance apparatus **10** is described as being adapted to fit
20 conventional trailer jack, the jack assistance apparatus **10** can be adapted to fit any type of jack that has controls similar to those illustrated in Figure 1 and described below without departing from the scope and spirit of the present invention.

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25 [0013] Figure 1 illustrates the lower portion of a trailer jack **102** with a jack assistance apparatus **10** mounted thereon. The illustrated jack **102** has telescoping tubes with a foot **118** attached to the innermost tube **116**. The telescoping tube **114** that surrounds the innermost tube **116** and is inside the outermost tube **112** has a spring loaded pin **120** that engages one of a series of

openings in the innermost tube **116**, thereby fixing the innermost tube **116** to the middle telescoping tube **114**. With the two smaller tubes **114**, **116** held in a fixed position, the jacking mechanism causes the two inner tubes **114**, **116** to extend or retract in relation to the outermost tube **112**, thereby lifting or lowering the trailer.

5 **[0014]** A clamping member **132** is attached to the middle telescoping tube **114** of the jack **102**. The clamping member **132** has a connection bracket **134** extending adjacent to the jack pin **120**. A lever arm **152** is pivotably connected to the connection bracket **134** and the lower end **156** of the lever arm **152** engages the jack pin **120** such that movement of the handle end **156** of the lever arm **152** causes the jack pin **120** to move laterally, causing the pin **120** to be either inserted or removed. A guide tube **142** is attached to the clamping member **132**. Running through the guide tube **142** is a chain **144** or other flexible member that is connected at one end to the jack foot **118** and the other end runs free with a grasping ring **146**. The end of the chain **144** connected to the jack foot **118** is secured to the jack foot **118** with a bolt and nut assembly **148**, a cleat, a repair link, or other fastening means. The grasping ring **146** is larger in diameter than the inside diameter of the guide tube **142**, and the ring **146** prevents the chain **144** from falling through the guide tube **142**. In the illustrated embodiment, the grasping ring **146** has an inside diameter larger than the outside diameter of the guide tube **142**, and the ring **146** can be placed over the upper end of the guide tube **142** for storage and to keep the free end of the chain **144** from swinging.

15 **[0015]** In use, when the jack **102** is in the stowed position, that is, with the telescoping tubes **114**, **116** collapsed or retracted inside the outermost tube **112**, the lever arm handle **154** is pushed toward the jack **102**, causing the jack pin **120** to be retracted and the innermost telescoping tube **116** to fall towards the ground. To return the jack **102** to the stowed position, the chain **144** is pulled while the lever arm handle **154** is pushed toward the jack **102**. The chain **144** pulls the jack foot **118** to move upwards and the inner telescoping tube **116** to move inside the middle telescoping tube **114**. When the inner telescoping tube **116** reaches the desired retracted position, the lever arm **154** is released, causing the jack pin **120** to return to its normal position and pinning the inner telescoping tube **116** to the middle telescoping tube **114**.

[0016] The lever arm **152** and the upper end of the guide tube **142** are at a height that is more convenient for the operator of the jack **102** and does not require the operator to bend over and grasp the jack foot **118**, which is resting on the ground, while pulling the jack pin **120** to disengage the inner tube **116**. The grasping ring **146** and the lever arm handle **154**, in one embodiment, are positioned at waist height for an average operator, which reduces the chance of a back injury from bending and lifting the jack foot **118** improperly.

[0017] Figure 2 illustrates the jack assistance apparatus **10** as an assembled unit. Figure 3 is an exploded view of the jack assistance apparatus **10**. The clamping member **132** includes two members **132a**, **132b**, which are fastened together by bolts **310**, **312**, **314** and corresponding nuts **320**, **322**, **324**. The clamping member **132** also includes an outer tube member **302** and an inner tube member **304**, through which a bolt **316** passes. Also illustrated is an optional spacer assembly that includes a spacer bracket **202** and spacers **330**.

[0018] The clamping member **132** is attached to the jack **102** by sliding the inner tube member **304** into the outer tube member **302** and using the bolts **310**, **312**, **314** and nuts **320**, **322**, **324** to secure the clamping member **132** to the jack **102**. The illustrated embodiment has a clamping member **132** sized to clamp onto a standard jack **102** with a four inch square tube. For jacks **102** that have a smaller tube size, for example, one with a three and one-half inch tube, the inner tube member **304** slides further into the outer tube member **302** and the spacer bracket **202** is used to fill the air gap formed between the jack tube **114** and the clamping member **132**. The spacers **330** are optionally used to center the spacer bracket **202** in the clamping member **132**.

[0019] After the clamping member **132** is attached to the jack **102**, the lever arm **152** is attached to the jack pin **120** by sliding the lever arm **152** such that an opening in the lower end **156** of the arm **152** engages the jack pin **120**. The lever arm **152** is attached to the connection bracket **134** by aligning an opening in the lever arm **152** with a corresponding opening in the connection bracket **134** and inserting a bolt **316** through the aligned openings. The bolt **316** is secured by a nut **326**, which can be a self-locking nut that is not tightened on the bolt **316** such that the lever arm **152** can pivot around the bolt **316**.

[0020] The guide tube **142** is attached to the clamping member **132** and extends above the clamping member **132**. The chain **144** is run through the guide tube **142**, and the chain **144** has a gripping ring, or handle, **146** at the end of the chain **144** extending above the clamping member **132**. The lower end of the chain **144** is attached to the jack foot **118** (illustrated in Figure 1). Those skilled in the art will recognize that the chain **144** can be attached to the jack foot **118** with either a bolt and nut assembly **148**, a cleat, a repair link, or other fastening means without departing from the scope and spirit of the present invention.

[0021] Figure 4 is a top view of another embodiment of the jack assistance apparatus **10**. In this embodiment, the clamping member **132** is set up as it would be if it were attached to a standard jack **102** with a four inch square tube. As can be seen, the spacer bracket **202** is not used in this embodiment.

[0022] Figure 5 is a side view of the jack assistance apparatus **10**. This figure illustrates the relationship of the lever arm **152** to the connection bracket **134**. The lever arm **152** has an opening at its lower end **156** that engages the jack pin **120**. The lever arm **152** has another opening that aligns with one of the openings in the connection bracket **134**. The bolt **316** is inserted through the aligned holes and, with nut **326**, loosely fastens the lever arm **152** to the connection bracket **134** such that the lever arm **152** pivots about the bolt **316**. Those skilled in the art will recognize that one or more openings in the connection arm **134** can be used, depending upon the range of adjustment desired, without departing from the spirit and scope of the present invention.

[0023] From the foregoing description, it will be recognized by those skilled in the art that a jack assistance apparatus has been provided. The apparatus includes a clamping member that attaches the apparatus to a standard jack, a guide tube and chain for lifting the jack foot, and a lever arm for operating the jack pin.

[0024] While the present invention has been illustrated by description of several embodiments and while the illustrative embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages

and modifications will readily appear to those skilled in the art. The invention in its broader aspects is therefore not limited to the specific details, representative apparatus, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or
5 scope of applicant's general inventive concept.

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